

**CLAIMS**

**WHAT IS CLAIMED:**

1. A mixer comprising:  
5 a multiplier circuit having a first and a second mixer; and  
a generator for generating two first and two second control signals for controlling said  
first and second mixers,  
wherein said two first control signals have a frequency  $f_1$  and said two second control  
signals have a different frequency  $f_2$ .

10 2. The mixer of claim 1, wherein said two first and two second control signals  
are balanced signals.

15 3. The mixer of claim 1, wherein said two first and two second control signals  
are single-ended signals.

20 4. A mixer for I/Q quadrature signal generation, comprising:  
a first multiplier circuit having a first and a second mixer;  
a second multiplier circuit having a third and a fourth mixer; and  
a generator for generating two first and two second control signals for controlling said  
first and second mixers and two third and two fourth control signals for  
controlling said third and fourth mixers,  
wherein said two first, two second, two third and two fourth control signals are in  
each case balanced signals, whereby said two first and two third control

signals have a frequency  $f_1$  and said two second and two fourth control signals have a different frequency  $f_2$ , and either said signals at frequency  $f_1$  or at frequency  $f_2$  are provided in four phases each shifted by  $\pi/2$ .

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5. The mixer of claim 4, wherein said first and second multiplier circuits each comprise a Gilbert cell having a plurality of transistors, where all transistors are used as switches.

10 6. The mixer of claim 4, wherein said generator comprises a frequency derivation circuit.

7. The mixer of claim 4, wherein the frequencies  $f_1$  and  $f_2$  of said control signals differ from an operation frequency of said generator.

13 8. The mixer of claim 6, wherein the frequency derivation within said frequency derivation circuit is executed by using frequency division.

20 9. The mixer of claim 6, wherein the frequency derivation within said frequency derivation circuit is executed by using frequency multiplication.

10. The mixer of claim 8, wherein voltages or currents within the circuit avoid the sum frequency  $f_1 + f_2$ .

11. The mixer of claim 8, wherein voltages or currents within the circuit avoid the difference frequency  $f_1 - f_2$ .